DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2014-0780; Directorate Identifier 2014-NM-168-AD]

RIN 2120-AA64

Airworthiness Directives; The Boeing Company Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: We propose to adopt a new airworthiness directive (AD) for The Boeing Company Model 747 airplanes equipped with a main deck side cargo door (MDSCD). This proposed AD was prompted by recent testing that indicates that intermodal containers, when loaded as cargo, under certain flight-load conditions, can shift and impact the adjacent fuselage frames. This proposed AD would require revising the airplane flight manual to incorporate limitations for carrying certain payloads. We are proposing this AD to prevent intermodal containers loaded in the offset method from shifting during flight gust loads and damaging fuselage frames, which could lead to the structural failure of the aft fuselage in flight, and subsequent in-flight breakup of the airplane.

DATES: We must receive comments on this proposed AD by **[INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

• Federal eRulemaking Portal: Go to http://www.regulations.gov. Follow the instructions for submitting comments.

• Fax: 202-493-2251.

• Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

• Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

Examining the AD Docket

You may examine the AD docket on the Internet at http://www.regulations.gov by searching for and locating Docket No. FAA-2014-0780; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this proposed AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Office (phone: 800-647-5527) is in the **ADDRESSES** section. Comments will be available in the AD docket shortly after receipt.

FOR FURTHER INFORMATION CONTACT: Steven C. Fox, Senior Aerospace Engineer, Airframe Branch, ANM-120S, FAA, Seattle Aircraft Certification Office (ACO), 1601 Lind Avenue SW., Renton, WA 98057-3356; phone: 425-917-6425; fax: 425-917-6590; email: steven.fox@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

We invite you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under the **ADDRESSES** section. Include “Docket No. FAA-2014-0780; Directorate Identifier 2014-NM-168-AD” at the beginning of your comments. We specifically invite comments on the overall regulatory, economic, environmental, and energy aspects of this proposed AD. We will consider all comments received by the closing date and may amend this proposed AD because of those comments.

We will post all comments we receive, without change, to http://www.regulations.gov, including any personal information you provide. We will also post a report summarizing each substantive verbal contact we receive about this proposed AD.

Discussion

Intermodal containers are common in the cargo shipping industry and transported by ships, trains, and trucks. The focus of this NPRM is an intermodal container that is nominally 20 feet long, 8 feet wide, and 8.5 feet tall. This nominally sized intermodal container includes the dimensions of an International Organization for Standardization (ISO) container ISO 668-1CC. The intermodal containers themselves do not meet the requirements of FAA Technical Standard Order TSO-C90D, "Cargo Pallets, Nets and Containers (Unit Load Devices)" (http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgTSO.nsf/0/ba3cb5aeb6d07bec8625792d0052e535/$FILE/TSO_C90_RevD_doc_FINAL_%20RGL_2011%200930.pdf); the lower surface on these intermodal containers is incompatible with most airplane cargo-loading systems (CLSs). These intermodal containers, however, can be concentrically loaded on an FAA-approved TSO-C90D pallet with the certified net combination and loaded in the center of the airplane, restrained by the CLS or a series of straps connected to the aircraft structure in accordance with the airplane's FAA-approved Weight and Balance Manual procedures for cargo that is not a Unit Load Device (ULD).

The Weight and Balance Manual is part of the Operating Limitations section of the Airplane Flight Manual (AFM). In accordance with 14 CFR 21.41, the Operating Limitations are part of the airplane type certificate and, therefore, can be modified only by changing that certificate; that is, by obtaining an amended or supplemental type certificate. Revisions to the AFM are approved as AFM supplements, and the approval is based on a finding that, with the AFM revisions, the airplane continues to meet the

applicable airworthiness standards. Operators are required to comply with the Operating Limitations by 14 CFR 91.9(a).

The FAA has become aware that some operators, both domestic and foreign, are not loading these containers in the center of the airplane, but rather in the standard left and right pallet positions. The 8-foot, 6-inch, height of the intermodal container interferes with the fuselage when loaded in the standard left and right pallet positions, so some operators have been transporting these intermodal containers shifted inboard off of the FAA-approved TSO pallets and attached to the pallet only with a net and/or straps. This method of transport is referred to as the "offset method." The practice of offsetting the intermodal containers results in the certified pallet-net combination having slack in the net by the amount of the offset. FAA observations have found the offset for intermodal containers is as much as 9 inches, with the corresponding 9 inches of slack in the TSO pallet net.

Although additional cargo straps have been used to restrain the intermodal containers to the pallets, the FAA determined that these straps are not effective, and the intermodal container can shift in flight.

In 2013, a U.S. cargo operator requested permission from the FAA to carry intermodal containers on Boeing Model 747 airplanes using the offset method – similar to procedures used by other U.S. and non-U.S. air carriers. Based on the FAA's review of the offset method, it denied the operator's request.

In March 2014, some U.S. cargo operators and Boeing conducted a series of full-scale tests, witnessed by the FAA, to demonstrate that carrying intermodal containers by the offset method could be shown safe and compliant to the applicable regulations. The test procedures were developed by engineers from Boeing and some U.S. cargo operators, and were intended to show compliance for flight loads on Model 747 airplanes

only. The results produced CLS failures and/or excessive deflections. The preliminary test results confirmed the FAA's safety concerns.

Testing New Methods

U.S. operators and Boeing conducted additional testing to demonstrate that carrying intermodal containers by the offset method could be shown safe and compliant to the applicable regulations. This testing used methods from National Aerospace Standard (NAS) 3610 with maximum payloads that were reduced from those tested previously. The intent was for Boeing to use the test data to develop an appropriate loading method that could be incorporated into the Boeing 747 Weight and Balance Manual. The certified pallet net was not used because previous testing showed it ineffective in restraining the ISO container as the offset of the container on the pallet introduces slack in the net, with the container essentially free to move laterally in the airplane by the amount of the offset.

Significant engineering resources were applied, and a complex method of strapping installation and procedures and sequence for tightening the straps was developed to preclude the excessive deflections experienced during earlier tests. While a few load cases were successful, some had very small margins (precluding any reduction of the complexity of the nearly 100 straps required). The testing was halted after attempts to substantiate vertical loading repetitively overloaded the forward and aft CLS restraint locks, and the proposed cargo restraining method was deemed unviable.

FAA Observations and Conclusions

FAA engineering from the Transport Airplane Directorate has been extensively involved in the testing of offset loading methods for intermodal containers with the objective to determine and document a safe and compliant methodology that could be the basis for a Boeing 747 Weight and Balance Supplement for airline use worldwide. Testing to date indicates this objective has not been met.

When positioned in accordance with the Weight and Balance Manual, the intermodal container is secured to the CLS pallet along its entire length by straps and netting. Offsetting the container has the effect of creating slack in the net and straps except at the ends of the container. As a result, when gust loads are encountered, most of the loads are transferred to the locks at the ends of the container and are not shared with the locks in the middle. This uneven loading has the effect of exceeding the structural capability of the locks at the ends of the container. This phenomenon quickly failed the forward and aft CLS locks during vertical testing, as confirmed by both sets of industry testing.

At this time, there is no offset method for restraining intermodal containers that has been demonstrated to be safe and compliant.

Safety Issue

The current practice of carrying an intermodal container by the offset method is not permitted by the Boeing 747 Weight and Balance Manual. A series of tests has verified that an intermodal container, under certain flight-load conditions, can shift in both the outboard and vertical directions. This shift by the intermodal container can damage as many as ten fuselage frames per container position during flight, leading to the structural failure of the aft fuselage in flight, and subsequent in-flight breakup of the airplane.

Normally the FAA does not issue ADs to address non-compliance with existing regulations. But because of the widespread nature of these practices, the FAA has determined that issuing an AD is the most effective means of addressing this unsafe condition.

FAA's Determination

We are proposing this AD because we evaluated all the relevant information and determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

Proposed AD Requirements

This proposed AD would require revising the Limitations section of the airplane flight manual (AFM) to incorporate limitations on carrying certain payloads.

Costs of Compliance

We estimate that this proposed AD affects 98 airplanes of U.S. registry. We estimate the following costs to comply with this proposed AD:

Estimated costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
AFM revision	1 work-hour X $85 per hour = $85	$0	$85	$8,330

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This proposed regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

We determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this proposed regulation:

(1) Is not a "significant regulatory action" under Executive Order 12866,

(2) Is not a "significant rule" under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),

(3) Will not affect intrastate aviation in Alaska, and

(4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive (AD):

The Boeing Company: Docket No. FAA-2014-0780; Directorate Identifier 2014-NM-168-AD.

(a) Comments Due Date

We must receive comments by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to The Boeing Company Model 747-100, 747-100B, 747-100B SUD, 747-200B, 747-200C, 747-200F, 747-300, 747-400, 747-400D, 747-400F, 747SR, 747SP, 747-8F, and 747-8 series airplanes, certificated in any category, equipped with a main deck side cargo door (MDSCD).

(d) Subject

Air Transport Association (ATA) of America Code 53, Fuselage.

(e) Unsafe Condition

This AD was prompted by recent testing that indicates that intermodal containers, when loaded as cargo, under certain flight-load conditions, can shift and impact the adjacent fuselage frames. We are issuing this AD to prevent intermodal containers loaded in the offset method from shifting during flight gust loads and damaging fuselage frames, which could lead to the structural failure of the aft fuselage in flight, and subsequent in-flight breakup of the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Revision of Airplane Flight Manual (AFM)

Within 14 days after the effective date of this AD, revise the Operating Limitations section of the FAA-approved AFM to include the information in figure 1 to paragraph (g) of this AD. This may be accomplished by inserting a copy of this AD into the Limitations section of the AFM.

Figure 1 to paragraph (g) of this AD – *AFM revision*

Unless approved by the Manager of the Seattle Aircraft Certification Office, the carriage of the following payloads is prohibited: 1) Intermodal containers nominally sized at 20 feet long, 8 feet wide, and 8.5 feet tall that are not concentrically loaded on a pallet and restrained to the aircraft in accordance with the FAA-approved Weight and Balance Manual or Supplement. 2) ISO 668-1CC containers that are not concentrically loaded on a pallet and restrained to the aircraft in accordance with the FAA-approved Weight and Balance Manual or Supplement. Note: Both payloads 1 and 2 may be concentrically loaded on a pallet and netted in accordance with the FAA-approved Weight and Balance Manual and then loaded in the center of the airplane and restrained to the airplane by the approved center loaded cargo restraint system or restrained directly to the airplane, both as defined in the FAA-approved Weight and Balance Manual.

(h) Special Flight Permits

Special flight permits, as described in Section 21.197 and Section 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199), are not allowed if any intermodal container prohibited as specified in figure 1 to paragraph (g) of this AD is on board. For special flight permits, carriage of freight is not allowed.

(i) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Seattle Aircraft Certification Office (ACO), FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the ACO, send it to the attention of the person identified in paragraph (j) of this AD. Information may be emailed to: 9-ANM-Seattle-ACO-AMOC-Requests@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(3) An AMOC that provides an acceptable level of safety may be used for any repair required by this AD if it is approved by the Boeing Commercial Airplanes Organization Designation Authorization (ODA) that has been authorized by the Manager, Seattle ACO to make those findings. For a repair method to be approved, the repair must meet the certification basis of the airplane, and the approval must specifically refer to this AD.

(j) Related Information

For more information about this AD, contact Steven C. Fox, Senior Aerospace Engineer, Airframe Branch, ANM-120S, FAA, Seattle Aircraft Certification Office (ACO), 1601 Lind Avenue SW., Renton, WA 98057-3356; phone: 425-917-6425; fax: 425-917-6590; email: steven.fox@faa.gov.

Issued in Renton, Washington, on November 21, 2014.

Jeffrey E. Duven,
Manager,
Transport Airplane Directorate,
Aircraft Certification Service.

BILLING CODE 4910-13-P

[FR Doc. 2014-28303 Filed 11/28/2014 at 8:45 am; Publication Date: 12/01/2014]